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# The impact of project-based organization on competence management practices: Case of Tunisian companies



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### ABSTRACT

*The present article aims to investigate the relationship between project-based organization and competence management practices (recruitment, assessment, training, compensation and career management). The central question of this research is formulated as follows: To what extent does project-based organization influence competence management practices? To answer this question, we adopt a quantitative study using a total of 156 Tunisian project managers. A linear regression analysis is used to test our hypotheses. The results show that the majority of competence management practices, namely recruitment, evaluation and training, are more relevant to project-based organizations. However, other practices, such as remuneration and career management, are insensitive to project activities.*

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## Introduction

Since the nineties, the business environment has been marked by accelerated economic pace as well as technological and organizational changes. Faced with these changes, companies have been forced to rethink their management practices in order to increase the quality of their products and services, reduce the life cycle cost and meet customers' needs (PMI, 2017). Two main consequences arise: the emergence of new forms of organization, in particular project-based organization as well as the emergence of the concept of competence management. These concepts have attracted increasing interest from researchers and practitioners.

Competence is defined as the ability of an individual, a group or a company to mobilize and combine resources in real work situations (Durand, 2015), while project-based organization is defined as any company that structures its tasks and adapts its operating rules from and around the projects to be carried out (Afitep-Afnor, 2000).

In this respect, the arrangement of human resources within project-based organization has undergone regular changes (Yang et al., 2015). This highlights the need to adapt novel human resource management policies to meet the specific needs of the such organizations (Bredin and Söderlund, 2006; Huemann et al., 2007; Bredin, 2008-1; Turner et al., 2008). Competency-based human resources strategies are a relevant solution (Medina and Medina, 2014). The relationship between competencies enhancement and the management of the projects is of paramount importance for the survival of companies as it would preserve and reinforce their competencies and enhance their capacity to conduct their projects properly.

The main purpose of this article was to explain the relationships between project-based organization and competence management. In other words, we aimed to provide answers to the following question: To what extent do project-based organization influence competence management practices? To answer this question, we resorted to previous studies, namely Crawford (2005), Söderlund and Bredin (2006), Bredin (2008-1), Melkonian and Picq (2011), Loufrani-Fedida & Saglietto (2016), etc.

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The remainder of the paper is organized as follows. Section 1 outlines the most pertinent literature on project and competence concepts. We propose to determine the research model and hypothesis related to it. In the second section, we present the methodology of our research. The third and fourth sections respectively present and discuss the results of the research. Finally, the paper ends with some concluding remarks.

## Literature review

### Theoretical studies

#### The concept of competence

Competence is defined as an underlying characteristic of a person that enables him/her to perform a particular job effectively (McClelland, 1973; Boyatzis, 1982; Spencer and Spencer, 1993). These authors highlight the relationship between competence and superior performance in employment. Since the 1970s, the term competence has emerged from the work of the psychologist McClelland, a specialist in the study of motivation and personal development. McClelland (1973) states that the approaches based on traditional intelligence tests are not good predictors of success and job performance. He therefore criticizes the psychometric approach to recruitment, which relies on intelligence rather than competencies to assess job performance.

Inspired by the work of McClelland (1973), Boyatzis (1982, p.21) provides a definition of competence as "*an underlying characteristic of a person in that it may be a motive, trait, skill, aspect of one's self-image or social role, or a body of knowledge which he/she uses*". The author argues that competencies proceed and lead to more effective or superior performance in the job. Boyatzis' definition presents two types of competencies: namely, standard competencies and distinctive competencies. The former usually include expertise, experience and knowledge that each individual must have to do their job. The latter differentiate clearly the best and least effective individuals. Indeed, the assessment of competence helps to identify the different attributes of personality (knowledge, attitudes, skills, etc.).

In line with the work of McClelland (1973) and Boyatzis (1982), Spencer and Spencer (1993, p.9) consider competence as an "*underlying characteristic of an individual that is causally related to criterion referenced effective and/or superior performance in a job or situation*". They argue that through competence, it is possible to predict the performance of the individual in different contexts during a certain period of time.

#### The concept of competence in project environment

Over the last few decades, researchers and practitioners of project management have become increasingly interested in the concept of competence (Young and Conboy, 2013). Indeed, the acceptance of this concept varies according to its perceptions by the different authors (Medina and Medina, 2014; Sadeghi et al., 2014).

Crawford (2005) developed a competency model based on the PMI, IPMA and AIPM<sup>1</sup> models. This model is a reference model for most researchers and practitioners in project environment (Medina and Medina, 2015; Bredillet et al., 2015) and it divides the concept of competence into three categories:

***Input competencies** include the knowledge and skills that the project actor must have to effectively perform their tasks in a real work situation. These competencies can be evaluated by the instruments of PMI and IPMA models. The Project Management Professional (PMP) exam assesses general knowledge related to project environment.*

***Process competencies** represent the personality attributes and behaviors of the project actor (motivations, character traits and self-esteem). Although these competencies are difficult to develop or evaluate, they can be determined using measurement tools proposed by academic research. Cattell et al., (1970) proposed a questionnaire that consists of evaluating the sixteen personality factors<sup>2</sup>.*

***Output competencies** are defined as the ability of the project actor to effectively realize his activities in accordance with the AIPM model, and this, by the effective application of his competencies in a real situation.*

According to Nijhuis et al., (2015), Crawford's model represents a holistic view of the concept of competence and combines two approaches. The first concerns the essential elements of competence. Thus, the individual becomes competent if he has the necessary skills to face a real situation. The second approach focuses on the individual's job performance. It consists in comparing the competencies held by the individual with those planned to be acquired in accordance with the AIPM model. The second approach assesses the results achieved through the competencies held by the project participant at his work. Rahmana et al., (2014) suggest that the individual must be successfully evaluated through each of the two aforementioned approaches in order to be recognized as competent. If a project actor does not demonstrate a certain level of job performance, it is difficult to judge that he/she is competent.

<sup>1</sup> PMI (Project Management Institute), IPMA (International Project Management Association), AIPM (Australian Institute of Project Management).

<sup>2</sup> The Cattell's 16 personality factors: Warmth, reasoning, emotional stability, dominance, liveliness, rule-consciousness, social boldness, sensitivity, vigilance, abstractedness, privateness, apprehension, openness to change, self-reliance, perfectionism and tension.

### **The concept of project-based organization**

Today's economic environment is becoming more volatile. It is characterized by fast technological changes and increasing competition. Accordingly, companies are compelled to respond to these changes, which are difficult to anticipate, with new organizational models towards greater flexibility and responsiveness. It is in this context that project-based organization emerges as an innovative organizational structure that denounces the hierarchical structure based on the standardization of routine and repetitive tasks (Turner and Keegan, 2000).

Project-based organization refers to different forms of organizations that involve the creation of temporary systems (Hobday, 2000; Lundin et al., 2015; Choi et al., 2018). Indeed, it is considered as a rapid and flexible response in an uncertain environment of globalization and competition.

Project-based organization encompasses different forms of organizations that require the creation of temporary systems (Hobday, 2000; Lundin et al., 2015). Different researchers, consultants and practitioners have proposed different appellation for this concept, such as "project-based organization", "project-led organization", "project-based firm", "project-based enterprise", "project-based company", etc. (Loufrani-Fedida & Saglietto, 2016; Mitrev et al., 2017). A PBO is an organization that organizes its tasks and selects its operating rules based on the planned projects (AFITEP-AFNOR, 2000). Due to the limited scope of this definition, many researchers have tried to further develop it. For example, Hobday (2000) distinguished two types of PBOs: First, "project-led organization", which has functional departments. They allocate a fundamental role to activities. Thus, projects go beyond functional units and influence decision-making. However, they remain under the authority of the hierarchical function. Second, the most extreme form of project-based organization is entirely managed by internal and external project activities with no functional harmonization of activities around the project. The survival of the organization is related in both cases to the success of the project. A more complex term was proposed by DeFillippi and Arthur (2002). For them, "project-based enterprise" is a body established to realize a specific project and fades once the project is accomplished, like in sporting events or production and making of films, etc.

Lindkvist (2004) presents "project-based firm" as a firm that functions in project mode by generating complex services and advanced tasks to meet the needs of its clients which may entail collaboration between companies (Business to Business Environment) and obviously the backing and harmonization of the functional units. Furthermore, the actors are associated with the organization instead of the project. In another study by Koskinen (2010), the term "project-based company" was used to label organizations whose products are made according to the precise desires of their customers.

In short, previous research works have used different terms to label the concept of PBO. In the present work, we use the term project-based organization for reasons of simplicity. As a result, we take the definition stated by several authors (Hobday 2000; DeFillippi and Arthur 2002; Lindkvist 2004; Koskinen 2010), in which project-based organizations are organizations that choose to carry out the majority of their activities in the form of projects rather than choosing the functional approach. This sort of organization can be either a subsidiary of a large firm or a consortium of organizations.

### **Empirical research and hypothesis development**

Organizations entail novel ways to implement the human resource management schemes to better adapt to project environment needs (Bredin and Söderlund, 2006; Huemann et al., 2007; Bredin, 2008-1; Turner et al., 2008). These organizations require the implementation of competency-based human resources policies (Medina and Medina, 2014). These authors propose a competency model that identifies human resource needs of project-based organization and that focuses on selection, training and development, performance evaluation, etc. In the same vein, Shih and Chiang (2003) emphasized the need to develop project-specific competence management practices, with a focus on recruitment, promotion, training and development, performance evaluation and compensation systems. Loufrani-Fedida and Saglietto (2016) highlight the micro-practices of competence management (evaluation, mentoring, recruitment and training) which are considered as organizational responses to the maintenance and development of the competencies of project team members. Finally, Turner et al., (2008) state that competence management practices must develop, evaluate and reward the project actor's competencies.

Recruitment policy is the process of finding the right person for each job in terms of expected performance and future prospects within the organization (Khan and Rasheed, 2015). Duif and Barry (2011) recommend the use of psychometric tests to collect information about potential candidates and their future behaviors during the recruitment process. Shiepley and Johnson (2009) stipulate that the rate of successful on-time completion of a project may improve when the organization selects the right individuals. Patanakul (2011) claims that a good match between project needs and individual competencies is an important factor for the success of a project. According to Ramli et al., (2010), problem-solving skills, decision-making, organization, time management, communication, creativity, innovation, leadership, etc. are necessary skills for the completion of the project and thus have to be given much attention in the recruitment process. Müller and Turner (2010) state that leadership attributes must be taken into consideration when hiring project managers, because they contribute to achieving better results in the project. Zarifian (1999) proposes notion of social competencies that are manifested through autonomy, responsibility and communication. Moreover, Ogunlana et al., (2002) state that experience is very important in evaluating a candidate. In fact, hiring highly qualified individuals allows the project-based organization to access new knowledge. For Huemann et al. (2004), recruitment practices in project-based organizations are less

formal than in Taylorist organizations. The job description in the project context is different from that in the functional organization because individuals work in temporary structures and tasks are not precisely defined.

Hence our first hypothesis:

*H1: The project-based organization has a positive effect on the recruitment policy.*

Competency assessment is one of the key issues in human resource management in project-based organization (Bredin and Söderlund, 2007). It plays a key role in the diagnosis of the health status of the human resources function (Belout, 1994). Competency assessment is a systematic and independent process that consists of making judgements about the performance of the individual in carrying out his/her tasks and assessing the degree of achievement of the planned objectives. For Raymond et al., (2015), assessment is defined as the process in which the organization obtains information on how effectively an employee performs his/her job. The information collected during the evaluation can be useful for decision-making and improving the employees' performance. Indeed, the assessment helps the supervisor to determine the development needs and compensation of each individual and also allows the project actor to have an idea about his performance results (Raymond et al., 2015). It highlights the weaknesses and strengths of the project actor (Tahsildari and Shahnaei, 2015) and aims to guide and motivate the activities performed by the employees in accordance with the objectives of the organization. This assessment takes place during an exchange between the employee and his/her supervisor with a frequency varying according to the organizational objectives. Takey and De Carvalho (2015) suggest that the assessment can be conducted at the end of each project phase in order to strengthen relationships among project team members. During the interview, the project actor must be allowed to discuss his/her problems and express his/her own personal goals. This allows the PBO to consolidate a representative image of the current state of its competencies portfolio.

Thus, the following hypothesis is formulated:

*H2: The project-based organization has a positive effect on the assessment policy.*

The training policy is widely recognized by researchers for its significant contribution to the success of project-based organization (Bredin, 2008-2). It provides a source of information and guidance on all the competencies the employee needs to succeed in his career (Antonacopoulou, 1999). Competence management places training policy, which improves the individual's competencies permanently, at the center of the learning process (Bredin, 2008-2). Thus, Training plays a crucial role in strengthening competencies to meet the requirements of the project environment (Bredin, 2008-2). Moreover, Tabassi et al., (2012) present training as an important strategic element for the organization. Indeed, the correct use of this policy makes it possible to optimize the achievement of organizational objectives and facilitate the adaptation of employees to their social and professional environment. In fact, investing in human capital contributes substantially to the overall performance of an organization, since systematic competency development is a key tool for improving the productivity and performance of project actors (Małachowski and Korytkowski, 2016). For Shahzad et al., (2016), if the employees do not have the necessary skills, the project-based organization must plan regular training programs to meet the current needs of the project. Training programs enable the individual to develop the skills required to stimulate their employability (Huemann et al., 2004). In addition, large organizations often provide development programs for experienced employees to prepare them to take on complex activities within the project-based organization (Bansal, 2015). Therefore, a competent, well-trained and versatile workforce brings added value to the PBO: higher productivity, better quality and lower cost (Ekrot et al., 2016-2; Huemann et al., 2016).

We can thus formulate the following hypothesis:

*H3: The Project-based organization has a positive influence on the training policy.*

Traditionally, compensation systems have been designed according to classification plans and salary scales (Shahzad et al., 2016). They are often unable to cope with changes in the business environment. Allen and Katz (1995) show that individuals are less motivated by traditional reward systems based on the project success criteria (time, cost and quality). The flexibility of project team members makes it difficult to establish a fixed salary level considering the frequent changes in missions and responsibilities (Fabi and Petterson, 1992).

Competence-based remuneration differs fundamentally from the traditional remuneration based on position and seniority (Huang and Zhu, 2013). Employees are rewarded according to the level of skills acquired (Balkin et al., 2015). In this regard, two employees doing the same work may have two different levels of remuneration. As a result, salary increase will be given to competitive individuals who demonstrate new or upgraded competencies in accordance with the needs of the project-based organization (Nalini et al., 2016). Employees must thus be duly rewarded through variable compensation plans (Moustaghfir, 2014). This encourages the employee to engage in filling the gaps in his competencies portfolio and developing his knowledge regularly (Kiznyte et al., 2015). Tabassi and Bakar (2009) state that a project actor should be motivated by financial compensation that reflects their competencies. PMI (2017) claims that reward strategies further enhance the competencies of project staff. Such a compensation encourages the project team members to accomplish their tasks effectively and improve their competencies incessantly. Thus, the Competence-based remuneration is perceived as a form of organizational support which contributes positively to satisfying employee needs (Nalini et al., 2016).

Thus, the hypothesis is formulated as follows:

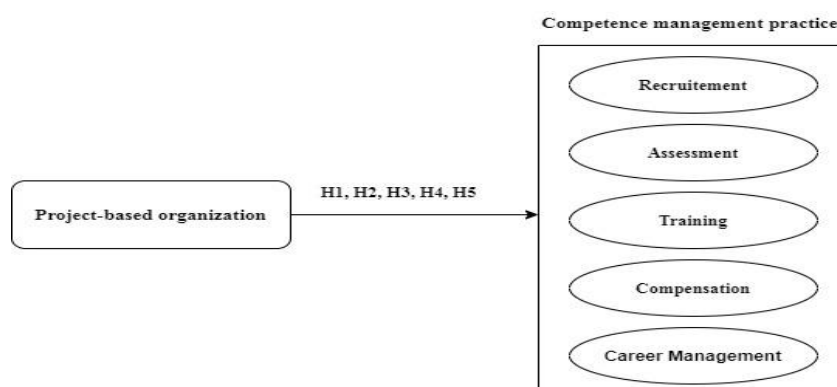
*H4: The project-based organization has a positive influence on the remuneration policy.*

Hölzle (2010) and Bredin (2008-2) state that the traditional career path is no longer sufficient to motivate the individual and support his professional development in project-based organizations. Casper and Storz (2017) state that career management has witnessed significant changes. In this new context, career plans are no longer concerned with qualifications and advancement, but are developed according to the individual's competencies (Azmi, 2010). Competence management is recognized as an essential tool for career progression (Pratner, 2007). Project-based organization should explicitly provide career opportunities to stimulate the development of individual competencies (Ekrot et al., 2016-1) and maintain the employability of project team members (Bredin, 2008- 2; Bredin and Söderlund, 2011-2). Each assignment of the individual to a new project represents a significant investment in his career and skills (Bredin and Söderlund, 2011-1). These career systems are particularly interesting and stimulating in project-based organization (Bredin and Söderlund, 2011-2), as they empower the individual to be responsible and proactive in the development of his career (El-Sabaa, 2001; Huemann et al., 2004; Bredin and Söderlund, 2006, 2011-1, 2011-2; Crawford et al., 2013; Lloyd-Walker et al., 2016). In this context, El-Sabaa (2001, p.6) states that " *Project managers have to take personal control over their careers by becoming more versatile in their skills, accepting change, and being active in shaping their life at work*". This requires initiative, flexibility, self-confidence and willingness to adapt to uncertainty (Lloyd-Walker et al., 2016). Thus, projects are increasingly perceived as creators of individual career paths. In addition, the project-based organization must demonstrate commitment to its employees in planning their careers (Lloyd-Walker et al., 2015). In fact, the organization must provide appropriate support systems such as recognition of acquired skills, adequate training courses and job rotation in order to meet their needs (Bredin and Söderlund, 2006; Turner et al., 2008; Alaei and Shahezaei, 2015).

Based on what proceeded, we advance the following hypothesis:

*H5: The project-based organization has a positive influence on the career management policy.*

In the light of the stated research hypothesis, our research model is detailed in figure 1. It is based on previous studies (Crawford, 2005; Söderlund and Bredin, 2006; Bredin, 2008-1; Loufrani-Fedida and Saglietto, 2016).



**Fig. 1:** The research model

## Research and Methodology

### The research questionnaire

The main purpose of this research was to study the relationship between project-based organization and competence management practices, using a hypothetico-deductive approach. To this end, we opted for the questionnaire survey as a research tool since questionnaires are the most used data collection method in management science research (Evrard et al., 2009). It helps the researcher to obtain the maximum amount of quantifiable data from a large sample.

The research questionnaire was structured around two main sections. The first section consisted of 4 descriptive questions presenting the respondent's personal characteristics: sex, age, experience and education level. The second section of the questionnaire includes 34 items that relate to the measurement of the research variables that were divided them into two main themes. The first consisted of six items devoted to project-based organization concept. The second consisted of 28 items addressing competence management practices.

In addition, we chose to measure each question related to the latent variables of the research model on the basis of 5 point Likert attitude scales: no agreement at all = 1, no agreement = 2, undecided = 3, agree = 4, strongly agree = 5.

The purpose of the pre-test is to assess the quality and overall coherence of the questionnaire (Malhotra, 2010). It involves submitting the questionnaire to a small sample of individuals who represent the study population. To this end, we requested, during the months of February and March 2017, the opinions of 10 Tunisian project managers from the region of Sfax- Tunisia. The results of the pre-

test allowed us to raise some suggestions and tips that have a great importance on the quality of statements. The respondents helped us refine the formulation of a number of items to be more understandable and clearer for the target population. Overall, we estimated that the average filling time of the questionnaire would be between 20 and 25 minutes.

As part of this research, we chose two administration methods: face-to-face interview and online survey. We first used the face-to-face interview, which enabled us to be present during the interview and to discuss directly with the project managers and convince them to cooperate. We ensured that the questionnaires were duly completed to minimize the number of incomplete responses. We clarified verbally the subject of the study and some questions without influencing the answers given by the respondents. The face to face survey took place in the regions of Sfax and Tunis in Tunisia between April and July 2017.

A total of 250 questionnaires were distributed to project managers. However, only 72 responses were recovered among which 8 questionnaires were discarded because they are not fully complete. Therefore, the final number of exploitable questionnaires was 64. The unwillingness to answer can be attributed to the lack of confidence and time constraints of project managers. In addition, we chose to manage our questionnaire online for reasons of geographic dispersion of respondents. We used the Google Docs website to host our online questionnaire. To this end, we built our questionnaire and then published it on the website server. Then, we also sent the hyperlink of the form by email to the various potential respondents.

The electronic questionnaire was sent to a sample of 500 project managers during the same period of the face-to-face survey. It was published only on the professional network "LinkedIn"<sup>3</sup>. First, we subscribed to a premium membership in LinkedIn site. Second, we searched business contacts to facilitate the choice of Tunisian project managers. A letter containing the subject of the study and the hypertext link to our online questionnaire was sent to each contacted member. A total of 92 valid responses were recorded. The two administration modes (face-to-face interview and online survey) totaled a final sample of 156 responses.

### **The operationalization of research variables**

The construction of the questionnaire requires the development of multi-item measurement scales borrowed from previous studies in the field of project-based organization and competence management. We used the measurement scales of Igalens and Scouarnec (2001) to operationalize the competence management practices. They are mobilized through the recruitment, assessment, training, compensation and career management. In addition, we selected six items to operationalize the project-based organization using the measurement scales of Bourgeon (2002), and Igalens and Scouarnec (2001). They outline the characteristics of work in project-based organization where the project manager has some responsibility in the successful completion of the project.

### **The sample**

We limited ourselves to question the people concerned with the main purpose of the research. First, we directed our choice to the managers and directors of projects who have a whole vision of the project operation. However, we noted that there is a difference in the level of responsibility between project managers and project directors. Indeed, the project director has a synonymous status as line managers. While the project manager does not have a formal authority. His/her role consists in influencing his/her collaborators so that their activities are mobilized to the project success.

Therefore, this understanding has led us to solicit all Tunisian project managers who operate in national and foreign companies in different regions of Tunisia. However, we asked only one project manager per company. We were interested in companies operating in different sectors of activity: pharmaceutical, automotive, food industry, oil and energy, etc.

Determining the optimal sample size seems essential for the relevance of statistical treatments. To determine the minimum sample size required, Hair et al., (2010) note that the number of responses must respect the multiplier rate of the number of items per measurement scale. In this regard, these authors suggest that the minimum sample size must exceed 10 times the ratio (number of the observations / number of items per scale). In the case of our research, the majority of the measurement scales include 6 items. The ratio condition is verified for all the measurement scales, it is always greater than 10 ( $156/6 = 25$ ).

We conducted a survey of Tunisian project managers. The majority of respondents (86.5%) are men. As for age, 19.9% of respondents are over 50 years old. Moreover, the majority of respondents (82.1%) have a professional experience over two years. Finally, 83.3% of respondents have a university degree (Table 1).

<sup>3</sup> **LinkedIn** is a professional networking launched on May 5, 2003 in California. It is an American business and employment-oriented service that operates via websites and mobile applications. As of June 2019, LinkedIn had 630 million registered in 200 countries.

**Table 1:** Characteristics of the respondents

Description	Frequency	Percentage
<b>Sex</b>		
Men	135	86.5
Women	21	13.5
<b>Age</b>		
Less than 30 years	23	14.7
30 to 39	58	37.2
40 to 49	44	28.2
More than 50 years	31	19.9
<b>Experience</b>		
Less than 2 years	28	17.9
2 to 5 years	49	31.4
6 to 10 years	36	23.1
More than 10 years	43	27.6
<b>Education level</b>		
Bachelor	51	32.7
Master	72	46.2
Doctorate	7	4.5
Other diplomas	26	16.7

## Empirical Data and Analysis

### Factor analysis

Before testing the research hypothesis, it is necessary to present the principal component analysis (PCA) in order to determine the factorial solution of each variable in the research. This first analysis must be completed by reliability tests in order to examine the internal consistency of the items of the same construct. Furthermore, the data collected are analyzed through the "SPSS" software (version 20.0).

The results of the factor analysis applied to the scales of measurements (Table 2) show that all values of the Kaiser-Mayer-Olkin (KMO) index are greater than 0.5. This proves the satisfactory capacity for factoring the data. Similarly, the PCA confirms the one-dimensionality of the variables. Finally, the reliability test values obtained are greater than 0.7. This confirms the internal consistency of the factors.

**Table 2:** The results of the factor analysis

Factor solutions	KMO	Total variance explained	Cronbach's Alpha	Number of items
Project-based organization	0.822	70.495%	0.894	5
Recruitment	0.833	74.625%	0.886	4
Assessment	0.728	76.779%	0.849	3
Training	0.808	76.447%	0.897	4
Remuneration	0.839	75.829%	0.894	4
Career management	0.809	71.862%	0.869	4

### Hypothesis testing

To test the hypothesis of the research, we performed linear regression analyses. First, we present the three first research hypothesis. The regression results show that the Fisher test is significant. This proves that the quality of the adjustment obtained is satisfactory. Hence, project-based organization has a positive and significant influence on the three variables: recruitment, evaluation and training. Thus, hypothesis H1, H2 and H3 are verified (Table 3).

Concerning hypothesis H4 and H5, the regression results show that the Fisher test is not significant with a probability greater than 10%. Hence, the project-based organization does not significantly influence the variables: remuneration and career management. Thus, hypothesis H4 and H5 are rejected (Table 3).

**Table 3:** Results of hypothesis tests

Hypothesis	Standardized coefficient (B)	Student's Test	T- P-values of Student's T-Test (p)	Results
<b>H1</b>	0.402	5.448	0.000	<b>Verified</b>
<b>H2</b>	0.308	5.101	0.000	<b>Verified</b>
<b>H3</b>	0.387	5.207	0.000	<b>Verified</b>
<b>H4</b>	0.115	1.140	0.152	<b>Rejected</b>
<b>H5</b>	0.120	1.501	0.135	<b>Rejected</b>

**Table 4:** Eliminated items in Factor Analysis

Factorial solutions	Criteria	Eliminated items
<b>Project-based organization</b>	Quality of representation less than 0.4	OPP4
<b>Recruitment</b>	MSA (measure of sampling adequacy) less than 0.5	REC3, REC6
	MSA less than 0.5	EVA2, EVA3
	Quality of representation less than 0.4	
<b>Assessment</b>	Factorial contribution less than 0.5	EVA1
<b>Training</b>	Quality of representation less than 0.4	FOR1
	Quality of representation less than 0.4	
<b>Compensation</b>	Factorial contribution less than 0.5	REM4
<b>Career management</b>	MSA less than 0.5	CAR2, CAR5

## Discussion and results

In what follows, we will discuss the results obtained from research hypothesis tests. We will also compare these results with those found in previous studies in order to deduce the main findings from the research.

### The relationship between project-based organization and recruitment policy

According to the first hypothesis (H1), the research results indicate that the project-based organization influences positively the recruitment policy ( $\beta_1 = 0.284$ ;  $p < 0.01$ ). These results are also consistent with several previous studies (Huemann et al., 2004; Ahsan and Khan, 2013; Dziekoński, 2017). According to Ahsan and Khan (2013) and Dziekoński (2017), the selection of a good project manager is a challenging task for any project-based organization. It is therefore important to place the best people in terms of competencies at the head of the project. There must be a rigorous methodology to recruit project team members. In other words, the development of recruitment methods is vital in order to select the appropriate project team members, as these individuals constitute the driving force of the entire project. Indeed, several studies highlight the important role of project team member as an active actor in project-based organization (Huemann et al., 2004). The project team members must have specific skills that differentiate them from other people. Furthermore, the selection process should focus on identifying potential employees who are able to work together.

### The relationship between the project-based organization and assessment policy

Regarding hypothesis H2, the research results show the existence of a positive and significant relationship between project-based organization and assessment ( $\beta_1 = 0.375$ ;  $p < 0.01$ ). These results are consistent with previous research studies (Ahadzie et al., 2009; Napier et al., 2009; Bočková et al., 2016). The main objective of the assessment process is optimizing the current performance of project team members. Indeed, traditional assessment systems have become increasingly ineffective. Ahadzie et al., (2009) argue that competencies must be taken into account in evaluating project participants. The assessment policy provides an analysis of the current state of employee skills and allows the project manager to better manage his workforce by improving the acquisition of knowledge and monitoring employee performance. Napier et al., (2009) developed an assessment tool around a selected set of skills. This tool helps measure current performance and predict future performance of project managers in the new technology sector. In addition, the survey of Bočková et al. (2016) developed a model that evaluates project managers from a set of ranked competencies: time independence, technical knowledge, ability to manage, aptitude and flexibility.

However, our research results concerning the relationship between project-based organization and assessment policy do not match those found by Stankova (2015) and Haudorf et al. (2014). These authors point out that in practice the assessment of skills is a difficult and stressful task for project managers, as this process requires the use of different skills, additional resources and patience. The assessment process includes a subjective dimension, because it is based on personal judgment of the evaluator. This sometimes



produces results that are not perfectly reliable. The face to face contact between the project team member and his evaluator sometimes activates the negative emotions that result in conflicts.

#### **The relationship between project-based organization and training policy**

The results of the linear regression analysis allowed us to validate our third hypothesis (H3): "project-based organization positively influences training policy" ( $\beta_1 = 0.341$ ;  $p < 0.01$ ). These results join those of Fricke and Shenhar (2000), Cheng et al. (2005), Lindholm et al. (2014), Marfuah and Panudju (2016) and Imran and Zaki (2016). According to Marfuah and Panudju (2016), organizations must provide project actors adequate training programs to upgrade their competencies to a higher level. Moreover, Fricke and Shenhar (2000) note that training provides employees with the possibility to take on different roles and responsibilities in projects. Indeed, training programs help project team members to be more responsible and engaged in their work, which leads to greater efficacy in the performance of their activities. For Cheng et al. (2005), training policy has the potential to improve the way organizations manage, develop and retain their human resources, which ensures project performance. Indeed, it is a necessary condition to guide the employees in the different phases of the project. Imran and Zaki (2016) argue that companies should make every effort to develop effective training programs in order to make the best use of their human resources and avoid the high cost at the end of the project. Companies must facilitate the training of targeted competencies and the continuous professional development of project team members. In addition, Lindholm et al. (2014) mentioned that the development of competencies can bring some benefits to organizations (improving performance and productivity, reducing production costs and resources waste, etc.).

However, our results do not match the studies of Hobday (2000), Cheng et al. (2005) and Von Meding et al. (2016). Cheng et al. (2005) find that one of the obstacles to implementing new performance solutions stems from the lack of training. Furthermore, Hobday (2000) indicates that project-based organization creates a working environment under pressure, which leaves little room for formal training. Von Meding et al. (2016) show that when the PBO does not have sufficient resources to develop the competencies of its employees due to limited budget, it becomes difficult to plan and prepare an adequate training program.

#### **The relationship between project-based organization and remuneration policy**

The results of the linear regression analysis show that there is no significant relationship between project-based organization and remuneration policy ( $\beta_1 = 0.115$ ;  $p = 0.152$ ). Therefore, hypothesis H4 is rejected. These results do not confirm those found by previous studies of Taylor (2010), Medina and Medina (2014) as well as Alaei and Shahrezaei (2015). Traditional pay systems based on job position and qualifications have been widely contested in project-based organizations (Liu and Zhao, 2009). They are unable to cope with the changes brought about by downsizing, technological change and new strategic priorities. According to Alaei and Shahrezaei (2015), compensating competencies stimulates employees to do their best, which helps the organization produce effective results. This type of reward has been identified as important for meeting basic needs of employees. An effective reward system can help a project team to achieve their goals while encouraging the desired behaviors.

However, research findings line up with the previous studies of Amoah et al. (2011), Becker and Smidt (2015) and Abuazoom et al. (2017). The establishment of the competence-based remuneration is not easy in an organization, because it is characterized by an increased labor cost (Dietrich et al., 2010). In fact, the competence-based remuneration is not only difficult to design but also to manage, which is why Gilbert (1994) argues that this type of system is rarely achieved by companies. It does not meet the expectations of many project managers compared to traditional pay systems. Project-based organizations are often associated with payment problems due to budgetary constraints (Amoah et al., 2011). These organizations cannot afford to pay competitive salaries. The project actor often demands higher wages because of short-term contracts. In addition, insufficient reward leads to reduced work efficiency. Moreover, Abuazoom et al. (2017) show that employees who receive rewards below their expectations are less willing to make additional efforts, which hampers the project performance. Becker and Smidt (2015) report that inequality in the remuneration system can have negative implications on the efficiency of certain project team members, which leads to reduced work efforts or high pay demands. This has a negative impact on the employees' creative thinking and their problem-solving ability. In addition, employees tend to compare their rewards and efforts with other project team members. Likewise, incorrect wage distribution can demotivate project actors. Therefore, building confidence will be more difficult.

#### **The relationship between project-based organization and career management policy**

The results of the linear regression analysis do not confirm hypothesis (H5), assuming that project-based organization influences career management positively ( $\beta_1 = 0.230$ ;  $p > 0.10$ ). This finding confirms those of previous studies by Hendrie (2004) and Turner (2018). Project-based work environment strongly influences the form of the career path. In fact, some organizations do not have clear career paths for the project actors (Turner, 2018). They often lack such professional development opportunities because of the temporary nature of their roles. Participation in the project can constitute a strong risk for career progression, which makes the status of the project actor very fragile within the organization. The project environment could be a source of motivation increase, commitment and job satisfaction for employees, but it could generate frustrations and anxieties relating to career development in project environment. Hendrie (2004) states that organizations with a no career development opportunities lead to an increase in job dissatisfaction.

We reached the conclusion that there is no positive and significant relationship between the project-based organization and career management policy. However, the rejection of this hypothesis seems contradictory with several previous studies (El-Sabaa, 2001;

Huemann et al., 2007; Turner et al., 2008; Hölzle, 2010; Huemann, 2010; Bredin and Söderlund, 2013). Hölzle, 2010 argue that traditional career systems prove irrelevant in project-based organization. The traditional concepts of career management should be revised to better fit the requirements of the project environment. In spite of the growing interest in the temporary context of project-based organization, previous research has paid little attention to the specific career systems in such organizations (Hölzle, 2010; Bredin and Söderlund, 2013). Project actors must continually develop their professional competencies throughout their careers. This involves learning new knowledge and updating existing competencies. El-Sabaa (2001) shows that project managers must maintain their interpersonal and technical skills to advance in their careers perfectly. These competencies allow the project actor to distinguish himself/herself from other individuals and reach more professional success. Competencies provide a useful basis to support the career development prospects in project-based organizations. Turner et al., (2008) state that career development is not only important for the project actor, but also for the organization. The project-based organization plays a supporting role: it should allow employees to acquire new competencies and improve their career prospects. In addition, Hölzle (2010) argues that organizations must continue to stimulate their staff and provide career development opportunities. Indeed, career programs are designed to help employees clarify their career aspirations, identify skill gaps and improve their performance. In addition, Huemann (2010) notes that career development opportunities constitute a privileged management tool to attract and retain project actors in their positions.

## Conclusions

The central question of our research was formulated as follows: To what extent does project-based organization influence competence management practices? To answer this question, we studied the relationships between project-based organization and competence management practices. To this end, we used linear regression analysis to confirm or refute the hypothesis of our research. We found that most of the hypothesis of this research are confirmed (H1, H2, H3). However, hypothesis H4 and H5 are rejected. These results show that the majority of competence management practices (recruitment, evaluation and training) are relevant to project-based organizations. However, other practices, such as remuneration and career management, are insensitive to project activities.

This research presents two theoretical contributions. First, project and competence concepts are often apprehended separately in theoretical and practical angles. Our research enabled us to explain the relationship between these two concepts. The results of hypothesis tests prove that the construction of the conceptual model is well approved. Our findings will enrich and complete previous research studies. The second theoretical contribution consists in treating competence management practices as a whole. Indeed, the majority of the research studies focused on isolated competence management practices. These studies do not deal with the concept of competence in a global vision, but they provide only a fragmented understanding of the studied phenomenon. However, our research presents a more systematic approach incorporating five competence management practices (recruitment, training, evaluation, compensation and career management). Furthermore, the construction and validation of the questionnaire constitute a methodological contribution of this research. In fact, this questionnaire may be subject for future research. It also provides concrete contributions to Tunisian project managers. The questionnaire could be applied by project managers as a support tool to diagnose and analyze different competence management practices. The information collected by the questionnaire could be used to develop competencies in project-based organizations. It would allow project managers to know which of the competence management practices are the most heavily involved in project-based organizations.

However, this study presents some limitations. First, it should be noted that the conceptual model proposed is not exhaustive. We should have considered other variables in the analysis. A second limitation lies in the one-dimensionality of the variable "project-based organization". We could have added new dimensions to measure this variable more precisely. Third, the sample size is small (156 responses). It is thus difficult to generalize the results obtained.

The limitations and contributions previously discussed open the way to new lines of research which may enrich the findings of our research. First, the conceptual model of this research could be enriched by examining the moderating role of certain socio-demographic factors such as, sex, age, experience and education level of the project manager. These moderating effects would allow us to better understand the relationships between project and competence concepts. Second, it would be relevant to reproduce this research according to the perceptions of line managers and project directors. Third, conducting a longitudinal study appears useful in order to test the solidity of our results. This would allow us to observe and compare the evolution of respondents' perceptions over time.

In conclusion, the results of this research have provided an enriching perspective on the study of the relationship between project-based organization and competence management practices.

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## Appendices

### The operationalization of research variables

#### Project-based organization

- **OPP1:** The project manager has a responsibility for the successful completion of the project
- **OPP2:** The project manager has strong authority over the project.
- **OPP3:** The project team members depend only on the project manager.
- **OPP4:** The project team members are free to modify certain aspects of their work.
- **OPP5:** The project team members are assigned full-time to the project.
- **OPP6:** The project manager has a certain autonomy to modify the rules and work procedures throughout the project.

#### Competence management practices

##### Recruitment

- **REC1:** During recruitment, what is important is the candidate's diploma and level of training.
- **REC2:** During recruitment, what is important is the experience acquired.
- **REC3:** During recruitment, what is important is the ability to cooperate with others.
- **REC4:** During recruitment, what is important is the ability to adapt and analyze.
- **REC5:** During recruitment, what is important is the contribution of the candidate to the company.
- **REC6:** During recruitment, what is important are the criteria of autonomy and taking initiative.

##### Assessment

- **EVA1:** I have an annual assessment of my competencies with my supervisor.
- **EVA2:** My supervisor is interested more in my behavior.
- **EVA3:** I have a personalized document which specifies my activities and my competencies.
- **EVA4:** I am assessed according to my knowledge
- **EVA5:** I am assessed according to my experience.
- **EVA6:** I am assessed according to my behavior.

##### Training

- **FOR1:** I can easily have a training course if I need it.
- **FOR2:** I have an individual training program.
- **FOR3:** I regularly participate in training courses.
- **FOR4:** My employability (ability to find work outside the company) is greater.
- **FOR5:** My skill level has increased through training.

##### Remuneration

- **REM1 :** My remuneration is based on my proven abilities and not on the function I hold.
- **REM2 :** My remuneration is based on my individual contribution to the company.
- **REM3 :** My remuneration is based on my skills used in my personal work situation.
- **REM4 :** My remuneration is based on my job function.
- **REM5 :** My remuneration is based on what I can bring to the company in the future.

##### Career management

- **CAR1:** I get information about my job and its activities.
- **CAR2:** I take less initiative.
- **CAR3:** I reach and often exceed the objectives.
- **CAR4:** In my work, I seek new ideas and I show creativity.
- **CAR5:** I no longer seek to make efforts to develop my skills.
- **CAR6:** In my work, I am enterprising and I am not afraid to act.